

## **FAA AEROSPACE FORECASTS FISCAL YEARS 2013 – 2033**

Developing forecasts of aviation demand and activity levels continues to be challenging as the aviation industry evolves and prior relationships change. In times of amplified volatility, the process is filled with uncertainty, particularly in the short-term. Once again, the U.S. aviation industry has shown that the demand for air travel is resilient as it rebounds from its most recent downward spiral caused by the Great Recession. As 2013 begins, lingering questions remain. Are the U.S. and global economies on firm ground? Have the structural changes undertaken by the industry over the past 5 years revamped the industry from one of boom-to-bust to one of sustainable profits? Will industry consolidation continue?

Given the current instability in the global economy, there is much uncertainty as to the timing and strength of a recovery in aviation demand. Nevertheless, the FAA has developed a set of assumptions and forecasts consistent with the emerging trends and structural changes currently taking place within the aviation industry. The intent of these forecasts is to accurately predict future demand; however, due to the large uncertainty of the operating environment, the variance around the forecasts is wider than it was in prior years.

The commercial aviation forecasts and assumptions are developed from econometric models that explain and incorporate emerging trends for the different segments of the industry. In addition the commercial aviation forecasts are considered unconstrained in that they assume there will be sufficient infrastructure to handle the projected levels of activity. These forecasts do not assume further contractions of the industry through bankruptcy, consolidation, or liquidation. They also do not assume any drastic changes in federal government operations.

The commercial aviation forecast methodology is a blended one. The starting point for developing the commercial aviation forecasts (air carriers and regionals) is the future schedules published by Innovata. To generate the short-term forecast (i.e., one year out) current monthly trends are used in conjunction with published monthly schedules to allow FAA forecasters to develop monthly capacity and demand forecasts for both mainline and regional carriers for fiscal and calendar years 2013-14. The medium to long-term forecasts (2014-2033) are based on the results of econometric models.

This year, FAA has changed its model for the U.S. domestic market from a GDP based model to a model based on real disposable personal income (DPI). FAA believes that aviation demand is a derived demand – that is, aviation demand depends upon the level of business and leisure activity in the economy. The level of business and especially leisure activity in the economy is driven in large part by the amount of disposable income (income after taxes) that is in the economy. As the U.S. economy recovers from the great recession, GDP growth may come from areas that don't necessarily translate directly into income growth (inventory accumulation or a reduction in imports). Furthermore, any changes in future tax policy that impact individual taxes will be more directly reflected in changes to DPI as opposed to GDP, and as such, FAA believes that

disposable income, rather than GDP, is a better metric to use for forecasting future demand. The result of this change is the forecast growth in domestic enplanements is lower by approximately 0.4 percent a year over the forecast horizon.

The general aviation forecasts rely heavily on discussions with industry experts conducted at industry meetings, including four Transportation Research Board (TRB) meetings of Business Aviation and Civil Helicopter Subcommittees in May 2012 and January 2013 along with estimates of the fleet from the FAA civil aircraft registration database. The assumptions have been updated by FAA analysts to reflect more recent data and developing trends, as well as further information from industry experts.

The FAA also presents the forecasts and assumptions to industry staff and aviation associations, who are asked to comment on the reasonableness of the assumptions and forecasts. Their comments and/or suggestions have been incorporated into the forecasts as appropriate.

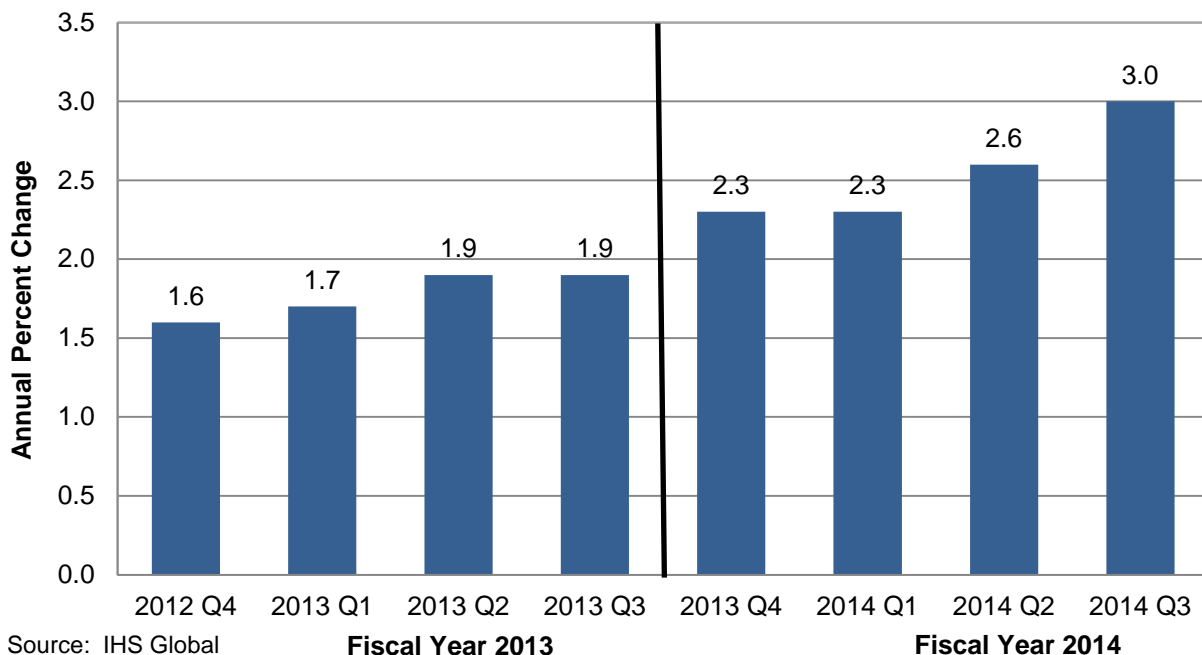
## ECONOMIC FORECASTS

For this year's Aerospace Forecast, the FAA is using economic forecasts developed by IHS Global Insight, Inc. to project domestic aviation demand. Furthermore, the FAA uses world and individual country economic projections provided by IHS Global Insight, Inc. to forecast the demand for international aviation services. Annual historical data and economic forecasts are presented in Tables 1 through 4. U.S. economic forecasts are presented on a U.S. government fiscal year (October through September) basis, whereas international forecasts are presented on a calendar year basis.

As the recovery is now approaching its fourth year, there continue to be headwinds. IHS Global Insight expects the recovery to continue to be modest by historical standards with the economy plagued by high levels of debt, both public and private, and uncertainty about U.S. government finances. How these issues are resolved will determine the future path of the recovery. On the bright side, the housing market is beginning to show signs of life and prior fears of a double-dip recession are unlikely to be realized.

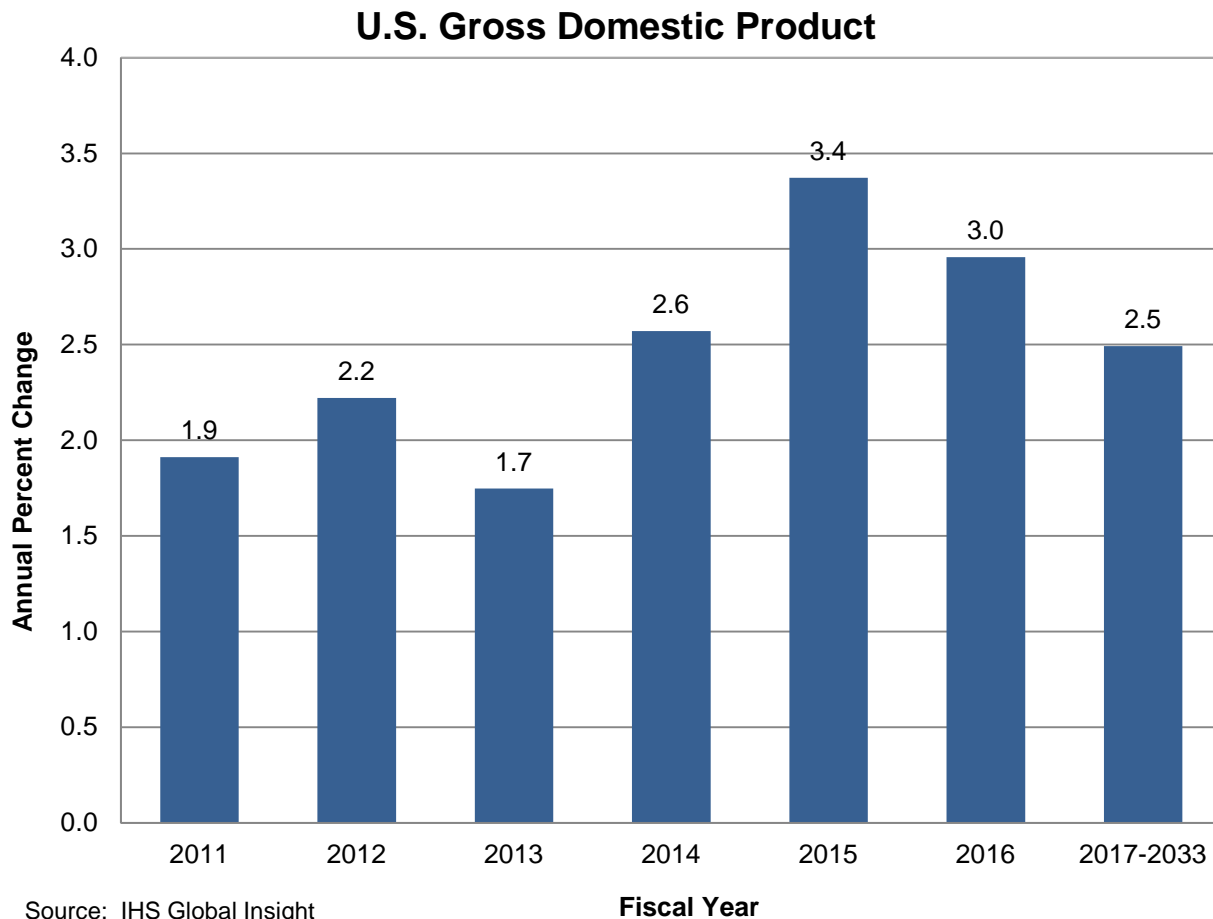
The boost to the economy from fiscal stimulus and inventory buildup has faded, leaving the economy to depend on underlying strength in private demand. Growth is projected to be slow in the first half of FY 2013 as reductions in government spending, expiration of the payroll tax cut, and a drag from Hurricane Sandy limit growth. On a quarter-by-quarter basis U.S. economic growth is projected to range between 1.0 to 3.1 percent for the next two years.

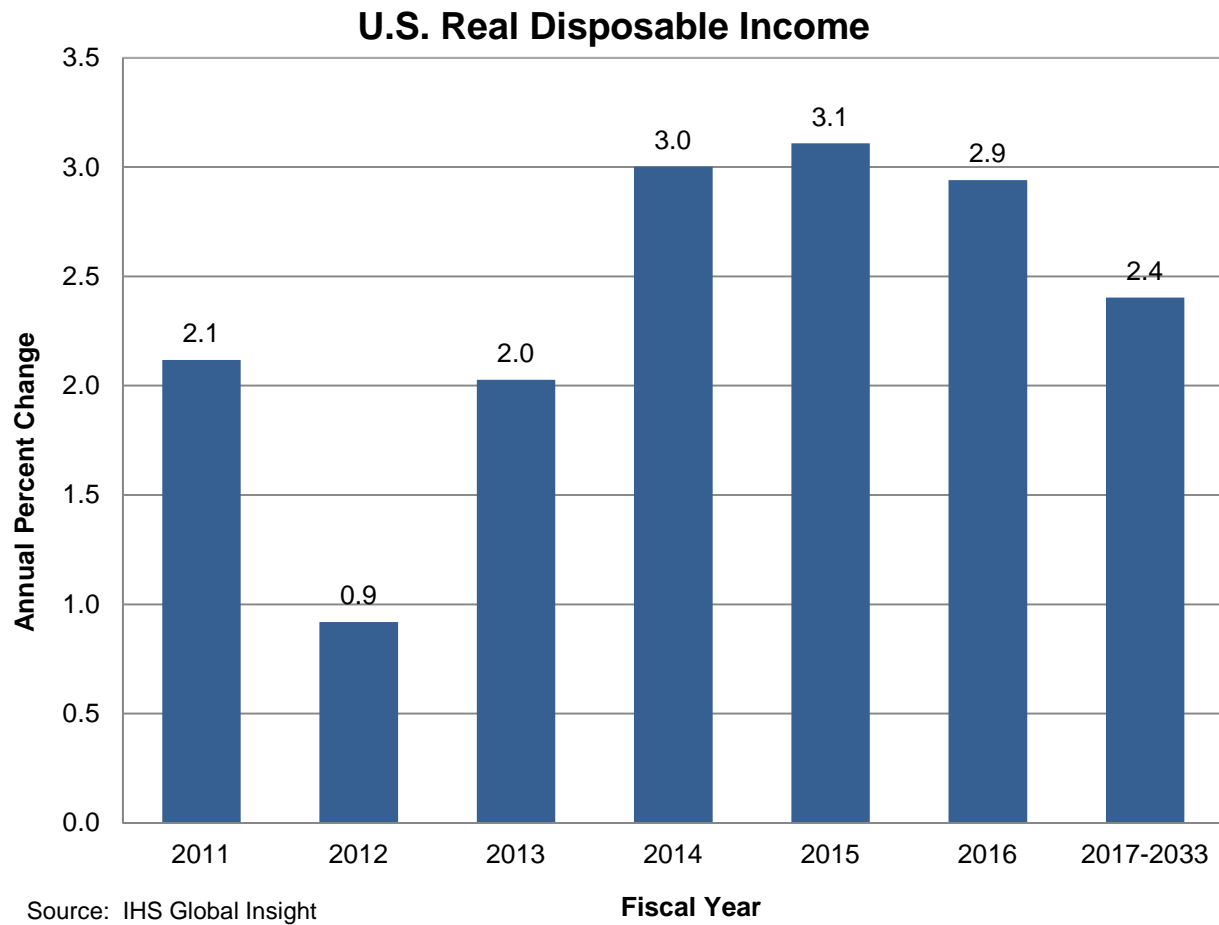
### U.S. Gross Domestic Product Seasonally Adjusted Annual Growth by Quarter



The modest pace of economic recovery has been most evident in the nation's unemployment rate. Since peaking at 9.9 percent in the fourth quarter of FY 2009, the unemployment rate has come down gradually, dropping to 8.1 percent in the fourth quarter of FY 2012. IHS Global Insight is projecting that with the continued modest pace of recovery, the unemployment rate will drop only modestly in FY 2013, averaging 7.8 percent for the year. The slow fall in the unemployment rate will continue to keep income growth in check. Real disposable income (income after taxes) increased only 0.9 percent in 2012. The recovery in real disposable income is projected to continue with increases of 2.0 percent in 2013 and 3.0 percent in 2014 as unemployment falls and the role of taxes in any long term fiscal solution becomes clearer.

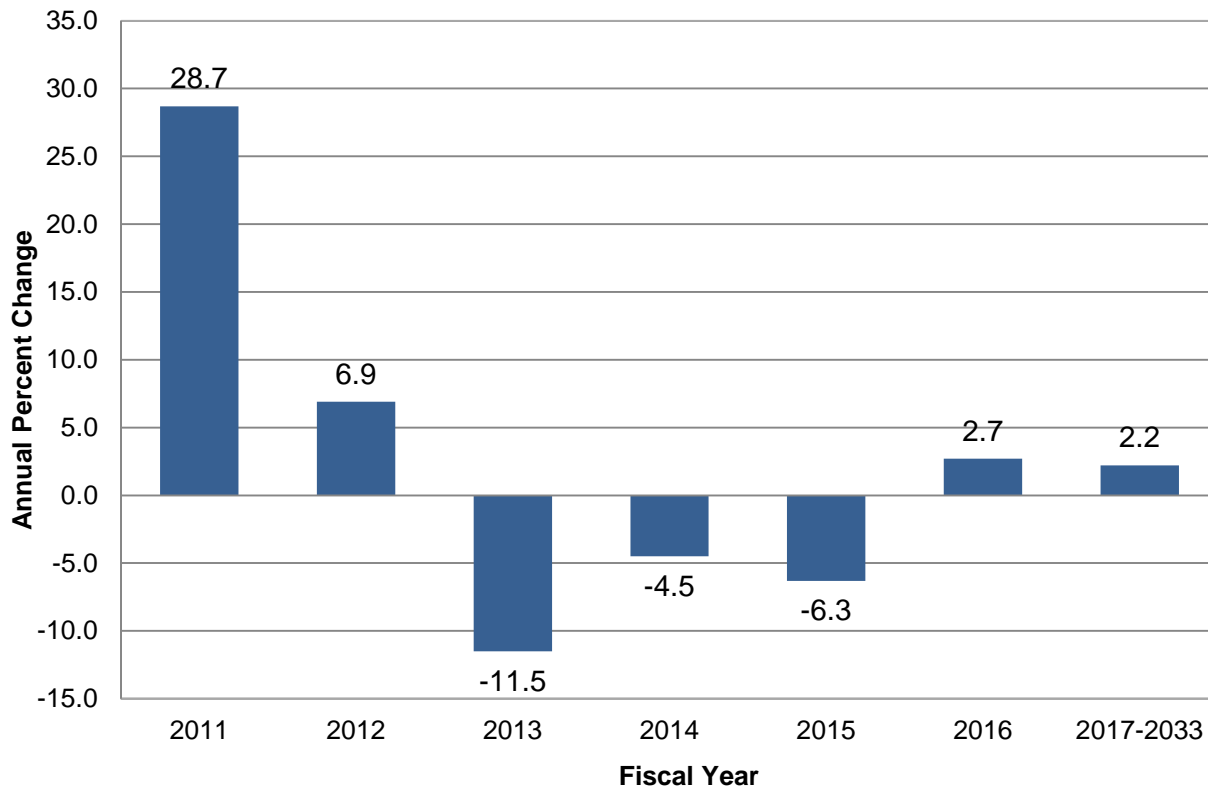
In the medium term, (the four year period between 2014 and 2018), U.S. economic growth is projected to average 2.9 percent per year with rates ranging between 2.6 and 3.4 percent. Income growth remains muted during the same period (up an average of 2.7 percent). For the balance of the forecast period, U.S. real GDP growth slows to around 2.5 percent annually while income growth increases to 2.4 percent annually. The long-term stability of U.S. economic growth depends on sustained growth in the workforce and capital stock along with improved productivity and competitiveness.





After the price of oil increased by 6.9 percent in 2012 and 88 percent in total since 2009, IHS Global Insight projects the price, as measured by the Refiners' Acquisition Cost, to fall to \$91 per barrel in 2013 (down 11.5 percent from 2012). Oil prices are forecast to decline to around \$81 per barrel by 2015 and then gradually increase to \$112 per barrel by 2025. For the remainder of the forecast period, oil prices are projected to grow slower than inflation, reaching \$125 per barrel by 2033.

### Refiners' Acquisition Cost



Source: IHS Global Insight

Inflation continues to remain in check as energy prices fall in 2013 and 2014. After increasing 2.4 percent in FY 2012, the inflation rate (as measured by the CPI), is projected to rise 1.4 percent and 1.7 percent in 2013 and 2014, respectively. After 2014, consumer price inflation is projected to grow between 1.7 and 2.0 percent per year for the balance of the forecast.

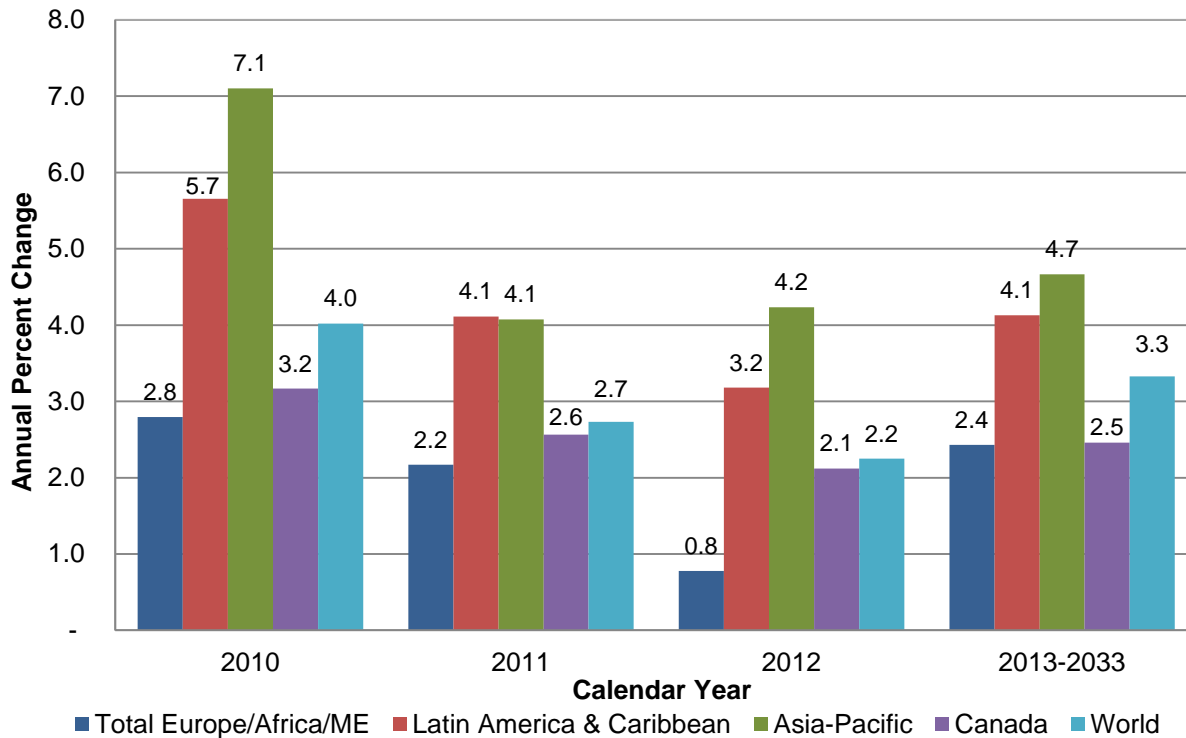
To reflect the uncertainty in the projection of economic growth, the FAA Aerospace Forecast uses high and low economic growth cases along with the base forecast. However due to the increased level of uncertainty surrounding the resolution of U.S. government finances (taxes and spending along with the debt ceiling), the optimistic and pessimistic economic growth cases are based on optimistic and pessimistic scenarios from IHS Global Insight's January 2013 U.S. economic forecast and go out only to 2022. The optimistic case sees a credible plan for long-term deficit reduction being enacted, faster foreign economic growth, along with faster employment growth and sustained improvements in the housing sector. Real GDP growth between 2012 and 2022 in the optimistic case averages 3.1 percent annually compared to 2.6 percent in the base case. The pessimistic case assumes partisan politics turn the task

of raising the debt ceiling into a political crisis and assumes that in the face of uncertainty, cutting spending is the best solution. In addition, the Eurozone crisis intensifies reducing demand for U.S. exports. The private sector retrenches and the housing market slows down, and the U.S. economy enters a mild recession in 2013. Real GDP growth in the pessimistic case averages 1.9 percent annually between 2012 and 2022, 0.7 percentage points lower than the base case. Further details about the high and low scenarios can be found in Appendix A.

## World Economy

After weathering the first contraction in global GDP since the Great Depression, a deepening recession in Europe and political stalemates in the U.S. over what to do with the U.S. federal budget, worldwide economic activity is estimated by IHS Global Insight to have expanded by 2.2 percent in 2012, down from 2.7 in 2011. The advanced economies (U.S., Canada, Western Europe, Australia, New Zealand, and Japan) posted growth in output ranging from a low of -0.2 percent to a high of 3.4 percent. The emerging market economies grew 4.8 percent, 1.4 points lower than in 2011 with the economy of China up 7.6 percent, India up 5.1 percent, Brazil up 1.5 percent, and Russia up 3.6 percent. In 2013, economic growth is projected to be 2.2 percent as weak household finances, sluggish employment growth, and constrained banking sectors of the advanced economies prevent global aggregate demand from growing fast enough to offset weakness from inventory accumulation, the recession in Europe, and the lack of stimulus spending. Beyond 2013 for the balance of the forecast period world real GDP is projected to increase an average of 3.2 percent per year.

### Real Gross Domestic Product by World Region



Source: IHS Global Insight, GDP Components Tables (Interim Forecast, Monthly), Release date 23 November 2012

The Asia/Pacific and Latin America/Caribbean regions will continue to have the world's highest economic growth rates. These regions are expected to see their economic activity grow at annual rates of 4.5 and 3.9 percent a year, respectively, over the forecast period (2013-2033). China, with a population of approximately 1.35 billion in mid-2012, is forecast to increase population by only 0.3% percent a year from 2012-2025 but is still projected to become the



world's second largest economy by 2013 (surpassing Japan). India, with a population of approximately 1.26 billion, is projected to see its GDP more than quadruple in size, growing at an average rate of 6.9 percent a year during the forecast period. In contrast, Japan grows at just 1.41 percent a year over the forecast horizon as structural impediments, the effects of the 2011 earthquakes and tsunami, and an aging population continues to limit growth.<sup>11, 12</sup>

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<sup>11</sup> 2012 World Population Data Sheet, Population Reference Bureau, [www.prb.org](http://www.prb.org)

<sup>12</sup> IHS Global Insight, GDP Components Tables (Interim Forecast, Monthly), Release date 23 November 2012

## AVIATION TRAFFIC AND ACTIVITY FORECASTS

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Total traffic and activity forecasts for commercial air carriers (the sum of mainline and regional carriers) are presented in Tables 5 through 9. These tables contain year-to-year historical data and forecasts.

Mainline air carrier traffic and activity forecasts and the forecast assumptions are displayed in Tables 10 through 18, 21, and 23. These tables contain year-to-year historical data and forecasts.

Regional carrier forecasts and assumptions are found in Tables 24 through 27. These tables provide year-to-year historical and forecast data.

Tables 19 and 20 provide year-to-year historical and forecast data for cargo activity. Table 22 provides year-to-year historical and forecast data for the cargo jet fleet.

General aviation forecasts are found in Tables 28 through 31. These tables provide year-to-year historical data and forecasts.

Tables 32 through 34 provide forecasts of aircraft activity at FAA and contract facilities.

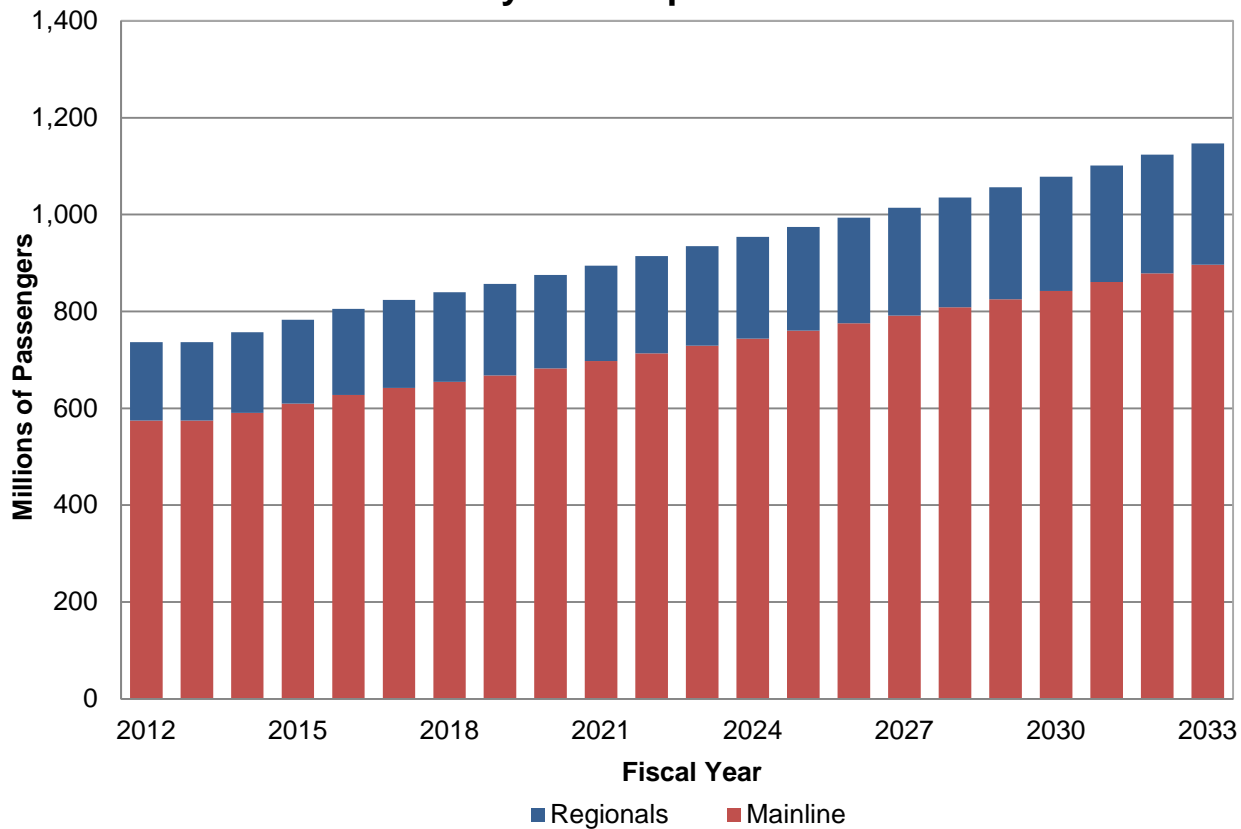
### Commercial Aviation Forecasts

System capacity is projected to decline slightly in 2013. In the domestic market, mainline carrier capacity expanded slightly (0.7 percent) in 2012 but now is projected to be unchanged in 2013 while capacity for the regional carriers is projected to decline in FY 2013 (down 0.4 percent). In the international sector, capacity is forecast to decrease in the Atlantic market and increase modestly in the Latin and Pacific markets -- resulting in overall international capacity decline of 0.5 percent.

Passenger demand shows minimal growth in 2013 with system RPMs forecast to grow 0.4 percent with all of the increase coming in domestic markets. An upturn in growth is projected for the 2014-18 period coincident with faster economic growth as system RPMs and passengers increase at an average annual rate of 3.2 and 2.6 percent, respectively. Over the same time period, system capacity growth averages of 3.1 percent per year. For the overall forecast period, system capacity is projected to increase an average of 2.8 percent a year. Supported by a growing U.S. and world economy, system RPMs are projected to increase 2.9 percent a year, with regional carriers (up 3.2 percent a year) growing faster than mainline carriers (up 2.9 percent a year). System passengers are projected to increase an average of 2.2 percent a year, with mainline carriers growing at a slightly higher rate (up 2.3 percent a year) than their regional counterparts (up 2.2 percent). By 2033, U.S. commercial air carriers are projected to fly 1.74 trillion ASMs and transport 1.15 billion enplaned passengers a total of 1.46 trillion passenger miles.

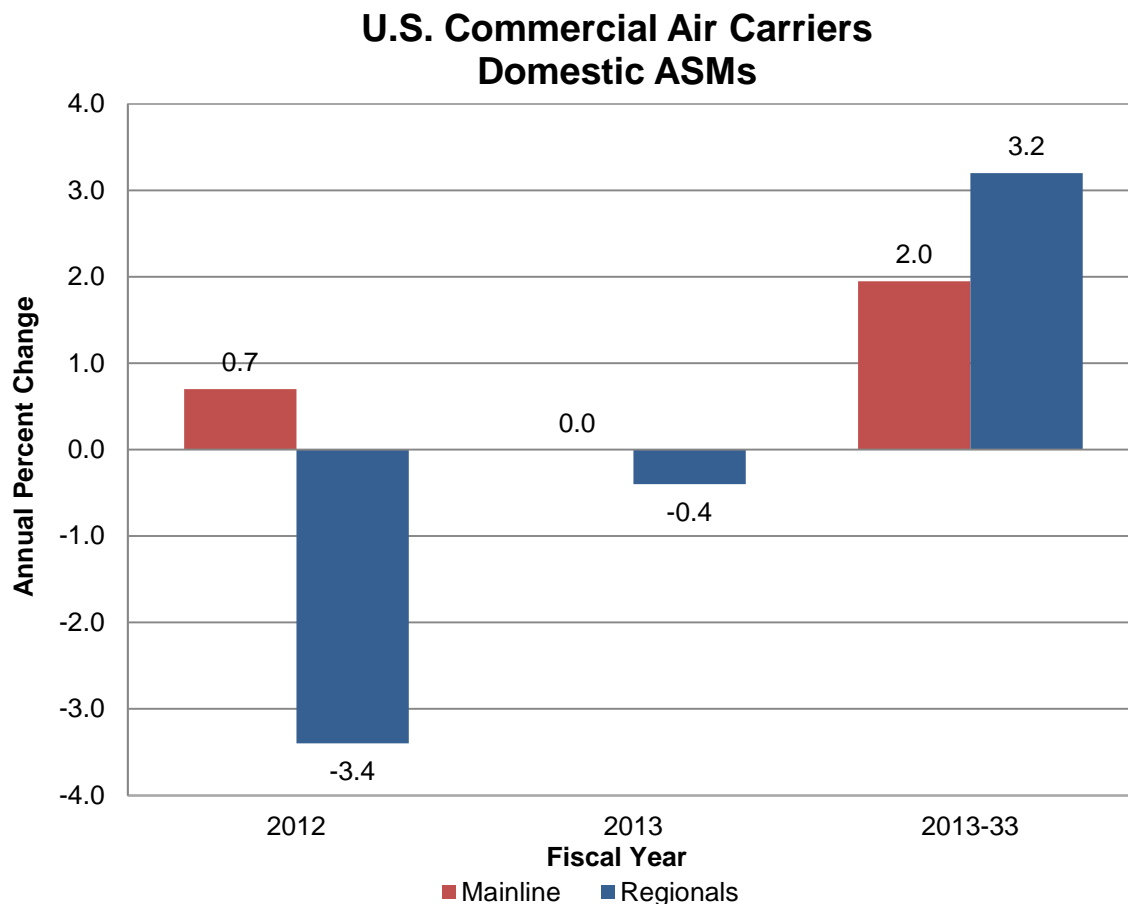
Planes will remain crowded, with load factors projected to grow moderately during the early years of the forecast period then tapering during the mid to latter years to 83.9 percent in 2033 (up 0.8 points compared to the beginning of the forecast period in 2013). Passenger trip length is forecast to increase by more than 153 miles over the forecast period to 1,275 miles in 2033 (up 8 miles annually). The growth in passenger trip length reflects the faster growth in the relatively longer international and domestic trips as compared to shorter-haul flights.

### U.S. Commercial Air Carriers System Enplanements



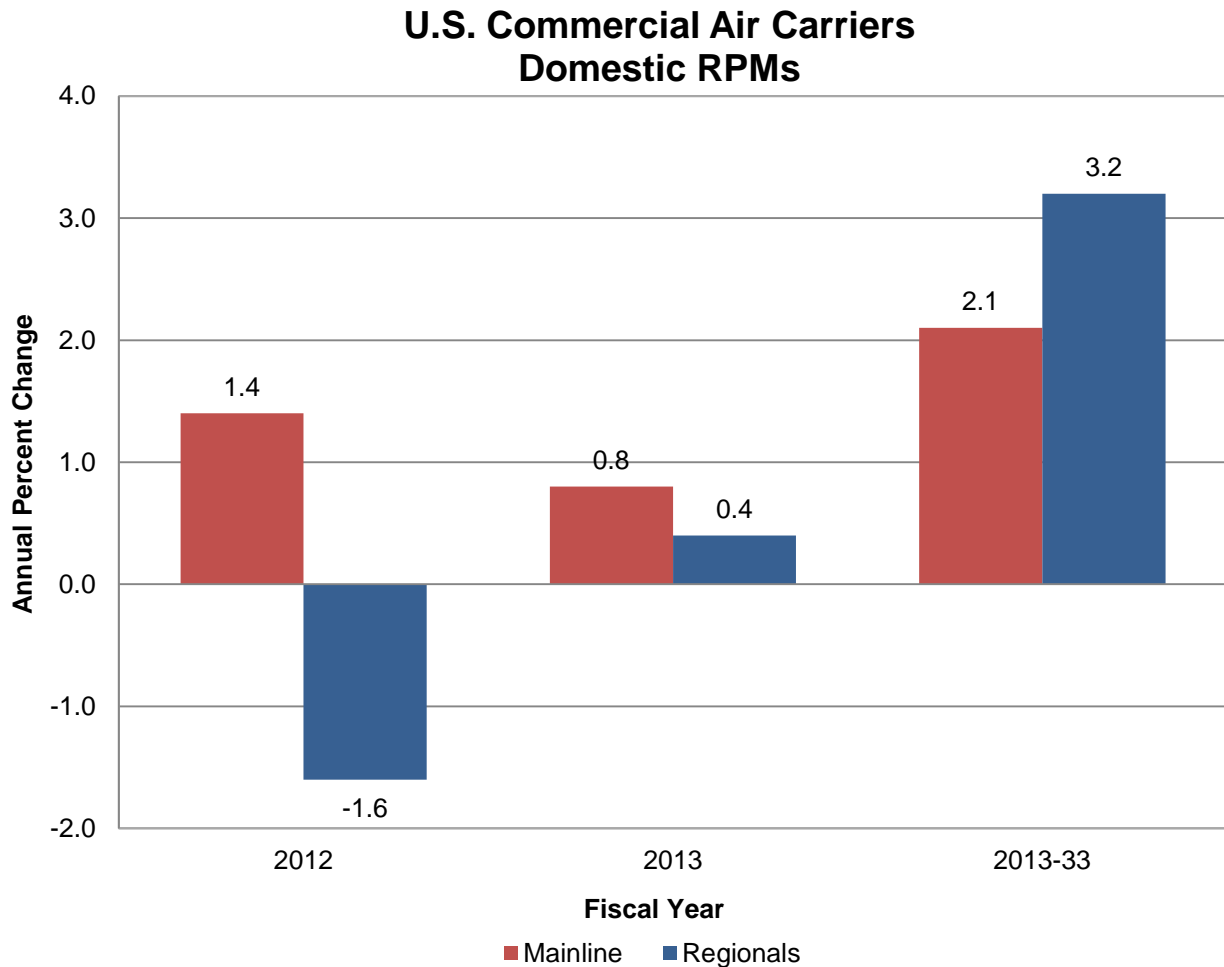
## Domestic Markets

After expanding slightly in FY 2012 (up 0.1 percent), domestic capacity is projected to remain unchanged in 2013. Mainline carrier capacity is forecast to be flat while that of regional carriers is expected to fall by 0.4 percent. Domestic commercial carrier capacity growth picks up in 2014-2018 period (up 2.3 percent per year) as U.S. economic growth accelerates, with mainline carriers growing slower than regional carriers, 2.1 percent versus 3.4 percent. For the entire forecast period (2013-2033), overall domestic capacity is projected to increase at an average annual rate of 2.1 percent, slower than economic growth. Mainline carriers are projected to grow at an annual rate of 2.0 percent while regional carriers are projected to grow at 3.2 percent a year.



The slow pace of the economic recovery in the U.S. will restrain RPM growth during 2013, the first year of the forecast (up 0.7 percent). Traffic growth is projected to be sluggish throughout the year as fiscal uncertainty continues to surround the U.S. economy. Mainline carrier RPMs are projected to increase by 0.8 percent during 2013, while regional carrier RPMs are projected to increase by 0.4 percent. Traffic growth improves over the 2014-18 period with annual RPM growth of 2.5 percent as the economic recovery gains steam. For the balance of the forecast period (2018-2033) modest economic growth and falling real yield drives domestic RPM growth of 2.1 percent a year.. Over the entire forecast period (2013-2033),

domestic RPMs grow an average of 2.2 percent a year with mainline carriers growing more slowly than the regional carriers (2.1 percent a year versus 3.2 percent a year, respectively).



Enplanements are forecast to decline slightly (down 0.1 percent) in 2013 following a 0.7 percent increase in 2012. Similar to RPMs, passenger growth is expected to pick up in the 2014-2018 period (up 2.4 percent a year) as the recovery gains momentum and then average 1.8 percent per year for the period 2018-2033. Over the entire forecast period, domestic enplanements are projected to grow at an average annual rate of 2.0 percent with mainline carriers growing more slowly than regional carriers (1.9 versus 2.2 percent a year, respectively).

Reduced capacity combined with a modest recovery in passenger demand provided pricing power for the carriers during 2012, with nominal yield increasing 3.5 percent (up 1.0 percent in real terms). In spite of slow demand growth, flat capacity will further lift fares higher in 2013, with an increase in nominal yield of 2.5 percent (1.0 percent in real terms). For the entire forecast period, nominal yield is projected to increase at an average rate of 1.2 percent a year, while in real terms it is projected to decline at an average rate of 0.8 percent a year. The decline in real yield over the forecast period assumes technological improvements, competition between carriers, and the increasing convergence of cost structures between network carriers and their low-cost counterparts. The convergence in cost structures between the carrier

groups arises from gains in productivity as network carriers retire fuel inefficient aircraft and hold the line on labor costs while low-cost carriers contend with aging fleets, maturing work forces, and unionization.

Domestic commercial carrier activity (departures) at FAA air traffic facilities is projected to grow more slowly than passenger traffic over the forecast period (1.4 percent per year for departures versus 2.2 percent for RPMs). This reflects increased carrier efficiencies in three operational measures: aircraft size, load factor, and trip length.

Overall domestic aircraft size increased by 0.9 seats to 123.4 in 2012 as increases in the mainline carrier group offset a slight decline in the regional carriers. Mainline carrier aircraft size increased 0.4 seats with the retirement of older, fuel inefficient aircraft (i.e. MD-80's and 737-300/400/500). Regional aircraft size decreased by 0.3 seats despite the retirement of 50-seat jet aircraft as larger 70-90 seat jet aircraft entered the fleet. Domestic seats per aircraft are forecast to increase in 2013 (up 0.6 seats) as mainline carrier capacity remains steady while regional carrier capacity falls slightly. Over the balance of the forecast (2014-2033), domestic seats per aircraft are projected to gradually increase to 127.8 seats by 2033, an average of 0.2 seats per year.

The FAA's projection of domestic carrier average aircraft size is greatly influenced by carrier fleet plans, publicly known aircraft order books, and the FAA's expectations of the changing domestic competitive landscape. In the near-term (through 2014), the forecast incorporates several assumptions: 1) mainline carriers desire to constrain ASM capacity growth; 2) the retirement of older inefficient aircraft (many of which are narrow-body); 3) the shifting of wide-body and larger narrow-body aircraft to international services, and 4) growing use of 70-90 seat regional jet aircraft.

In the longer-term, network carriers will replace their older narrow-body aircraft (A320's/B757-200/300) in their domestic route networks with next generation, narrow-body aircraft like the A320 Neo and the 737 Max. The use of smaller aircraft, like the 100-seat Embraer 190, to supplement carrier route structures will be limited. The use of the next generation, narrow-body aircraft will allow mainline carriers to better serve their customers by more closely matching supply (the number of seats) with demand (the number of passengers), and improve profitability through lower operating costs.

Mainline carrier domestic aircraft size increased in 2012 by 0.4 seats to 152.7 seats, and is projected to increase by 0.3 seats in 2013. Domestic aircraft size for mainline carriers is projected to increase by 0.3 seats in 2014 and then gradually increase for the balance of the forecast. Overall, average aircraft size for the mainline group will increase by 5.7 seats between 2012 and 2033, going from 152.7 to 158.4.

Regional carrier aircraft size flown domestically is projected to grow at a much faster pace than that of the mainline carriers. The faster growth in aircraft size for regional carriers is stimulated by continued deliveries of 70 to 90 seat regional jet aircraft that are entering the fleet as well as reductions in the 50-seat and under jet fleet. Regional carriers are better equipped to support operations of their mainline partners by providing capacity that complements market demand. The larger share of 70 to 90-seat regional jets in the fleet coupled with significant 50-seat jet and small turboprop retirements over the next few years increases the average seating

capacity of the regional fleet from 56.1 seats in 2012 to 56.9 seats by 2014. Over the course of the forecast, the seats per aircraft ratio for the regional carriers increases an average of 0.4 seats per year to 65.4 seats in 2033. The changing aircraft fleet mix is narrowing the gap between the size and aircraft types operated by the mainline and regional carriers.

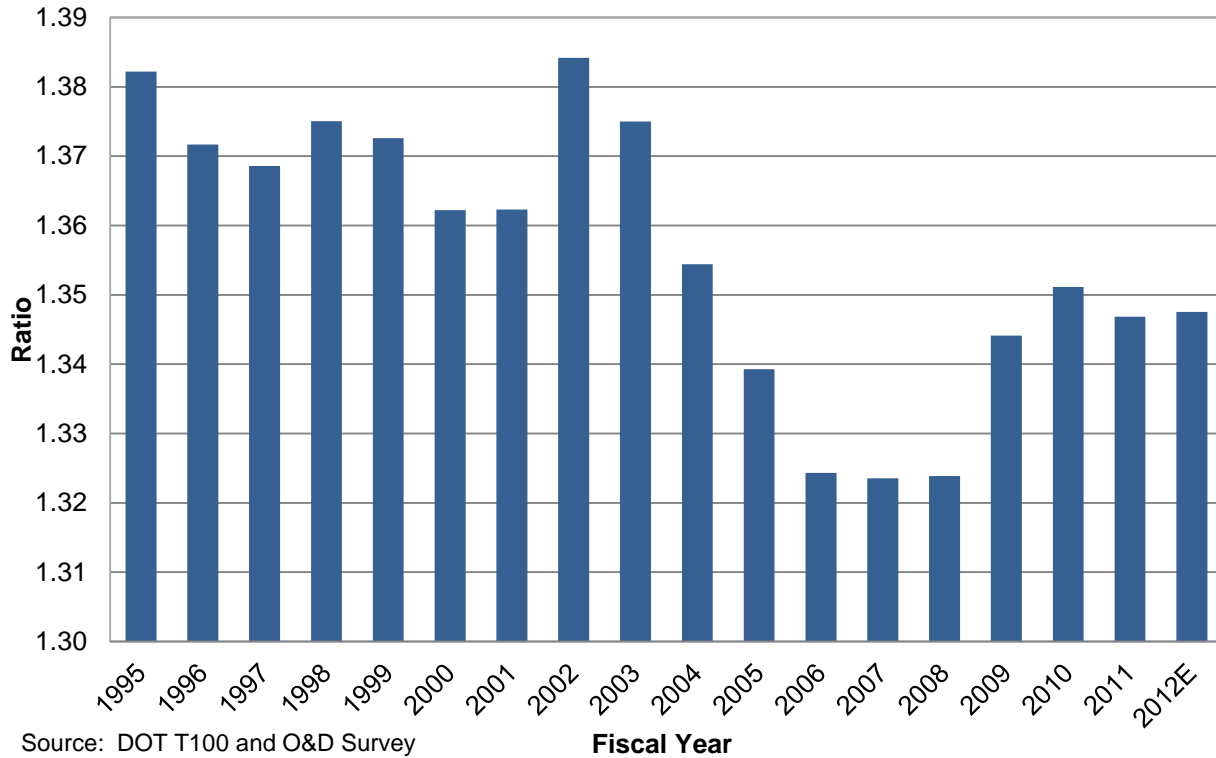
The commercial carrier domestic load factor increased 0.7 points during FY 2012 to an all-time high of 83.2 percent, with record load factors posted by the mainline and regional carrier groups. The mainline carrier group posted a load factor of 84.1 percent, up 0.5 percentage points from 2011. The load factor for the regional carriers increased by 1.4 points to 77.6 percent. In 2013, the domestic load factor is forecast to increase 0.6 points to 83.2 percent as both mainline and regional carriers increase by 0.6 percentage points. Thereafter, the commercial carrier domestic load factor gradually rises to 85.2 percent by 2033.

In 2012 the average domestic passenger trip length increased by 3.5 miles to 883.6 miles in total, after increasing by 5.1 miles in 2011. Passenger trip length is forecast to increase by 7.2 miles in 2013 as carriers continue to restructure their networks and realign capacity. After 2013, trip length is projected to remain stable for a number of years before steadily increasing from 2018 onwards, reaching 939.8 miles by 2033. The increase in trip length reflects longer trips flown by the mainline and regional carrier group. Mainline carrier trip length increases as thinner, relatively shorter haul markets are relinquished to regional partners and replaced with longer domestic trips. Regional carrier trip length increases as flying in shorter haul markets is abandoned and/or reduced as more of the larger 70 and 90-seat regional jets continue to penetrate thinner longer-haul markets previously served with mainline equipment.

Another key factor in predicting aviation activity relative to passenger demand is the level of connecting versus non-stop (origin-destination) traffic. However, as the current cycle of U.S. airline industry restructuring unfolds and hub structures change, the impact on local communities and airport activity levels can vary significantly.

The FAA analyzes the ratio of passenger enplanements to origin-destination (O&D) passengers over time to identify changes in connecting versus non-stop traffic. This ratio is an indicator of the tendency of the average passenger to connect during a typical journey. The closer the ratio is to 1.0, the more passengers fly on a point-to-point routing. As the chart below shows, the overall ratio for the U.S. domestic industry varied within a narrow band between 1995 and 2002. After 2002, the ratio trailed downward to its lowest level (1.32 enplanements for every O&D passenger) by 2007. The decline in the ratio during this six year period is characterized by a drop in connectivity by the network carriers and a rising passenger share for the low-cost carriers. A slight uptick in the ratio started again in 2009 (1.34 enplanements for every O&D passenger) and continued into 2012 (1.35 enplanements for every O&D passenger); this highlights the retrenchment by carriers as fuel costs skyrocketed and demand for air travel plummeted. The FAA's forecast recognizes the changing pattern of domestic traffic connectivity and these trends are captured in the forecast's passenger enplanement totals.

### U.S. Commercial Carriers Domestic Enplanements per Origin-Destination Passenger



### International Markets

#### U.S. and Foreign Flag Carriers

The FAA provides forecasts of total international passenger demand<sup>13</sup> for travel between the United States and three world travel areas: Atlantic, Latin America (including Mexico and the Caribbean), and Asia/Pacific, as well as for U.S.–Canadian transborder traffic. These forecasts are based on historical passenger statistics provided by the U.S. Customs and Border Protection<sup>14</sup> and Transport Canada, and on regional world historical data and economic projections from Global Insight, Inc.

Total passenger traffic between the United States and the rest of the world is estimated to total 171.8 million in CY 2012, 3.7 percent higher than in 2011. Passenger demand remains consistent in 2013 (up 2.6 percent) and accelerates in 2014 (up 4.5 percent) as the world economic recovery solidifies. For the balance of the forecast period, stable worldwide economic growth leads international passengers to grow at an average rate of 4.1 percent a year, totaling 402.9 million in 2033.

<sup>13</sup> The sum of U.S. and foreign flag carriers.

<sup>14</sup> Customs and border protection data is processed and released by the Department of Commerce.

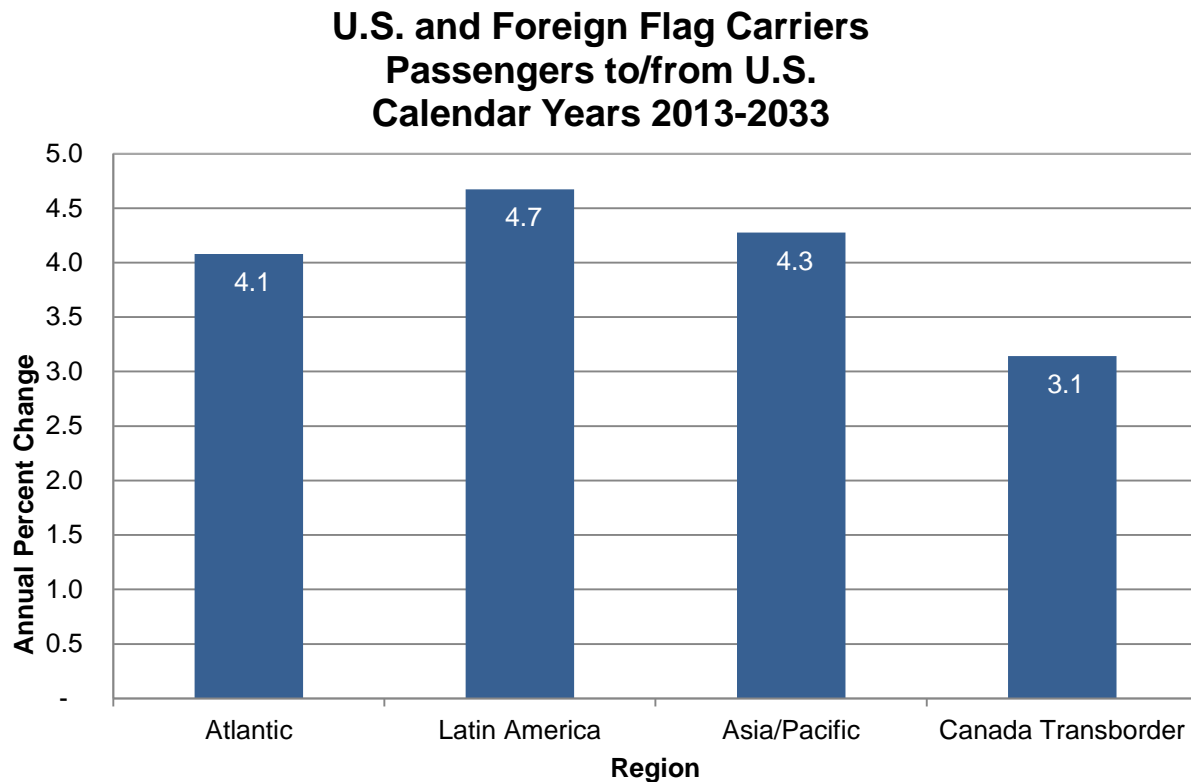


In the Latin America region, sustained economic growth drives passenger growth to an average of 4.7 percent a year over the entire forecast period (2013-2033). The highest growth is projected for Brazil (average annual growth of 6.1 percent) while the largest market in the region, Mexico, grows at an average of 4.6 percent a year. The slowest rates of growth are projected to occur in the Bahamian and Jamaican markets (averaging growth of 0.1 and 2.8 percent a year, respectively).

Emerging economies in the Asia-Pacific market boost passenger demand an average of 4.3 percent per year. Taiwan, South Korea, India and China (passenger growth of 4.7, 4.7, 5.2 and 6.7 percent a year, respectively) are forecast to be the fastest growing markets in the region. Growth in the Japan market (the largest and most established in the region) is projected to be well below the regional average at 3.0 percent a year.

In the more mature Atlantic market, the Open Skies agreement between the European Union and the United States along with competition between global airline alliances helps fuel passenger growth of 4.1 percent a year over the forecast period. Over the 20-year forecast horizon, average annual passenger growth in the top four Atlantic country specific markets (the United Kingdom, Netherlands, Ireland and Germany) is 3.9, 4.0, 4.6, and 4.7 percent, respectively.

Growth in the Canadian transborder market is forecast to be higher than that of the domestic U.S. market (2.0 percent), averaging 3.1 percent a year over the forecast period.

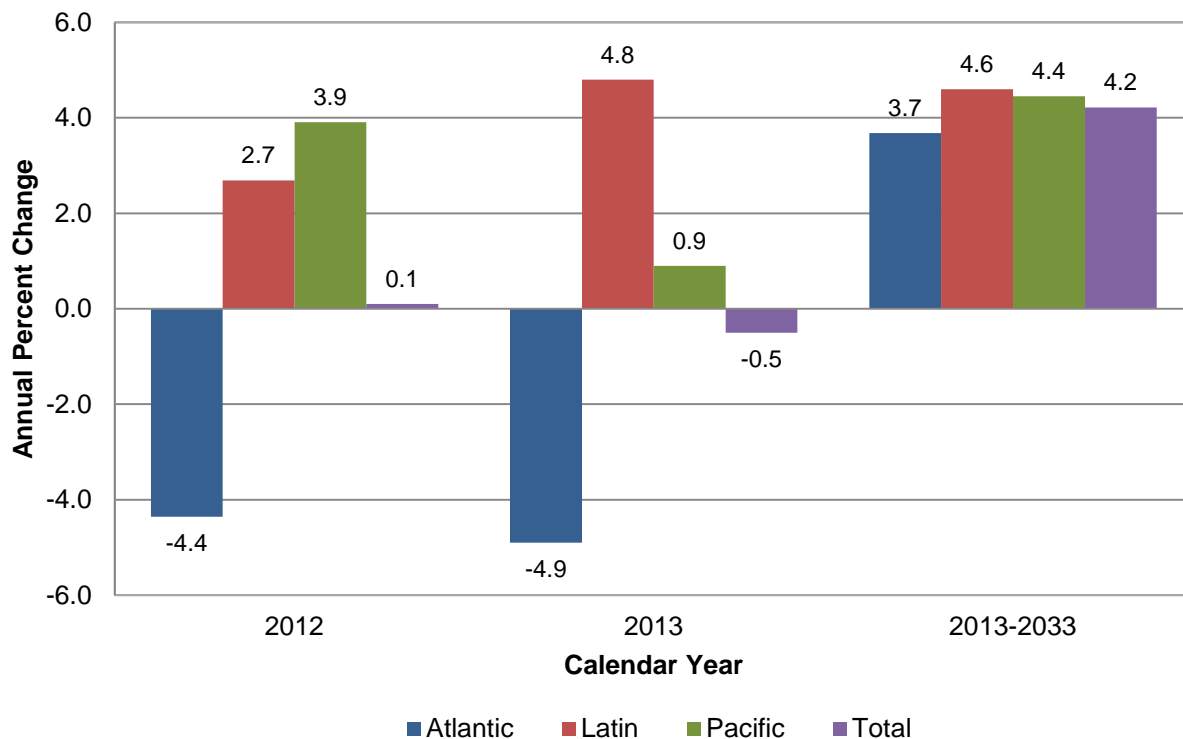


Source: US Customs & Border Protection data processed and released by Department of Commerce; data also received from Transport Canada

## U.S. Flag Air Carriers

International U.S. commercial air carrier capacity saw minimal growth overall in 2012, up 0.1 percent from 2011. The Atlantic market fell quite a bit (down 4.4 percent) after having made a recovery in 2011 whereas both the Latin and Pacific markets continued their upward trajectories (both up 3.9 percent) but at diminished rates compared to 2011. In 2013, moderate demand and increasing competition between global alliances is expected to boost capacity in Latin (up 4.8 percent) and the Pacific (up 0.9 percent) markets but lackluster performance in the Atlantic (down 4.9 percent) market will result in overall international capacity falling by 0.5 percent. System-wide capacity is projected to recover in 2014 (up 3.9 percent), fueled by stronger economic growth projected for all world regions, and is projected to average 4.2 percent a year for the remainder of the forecast period. Moderate growth over the forecast period reflects favorable U.S. and world economic activity as it recovers from the global contraction.

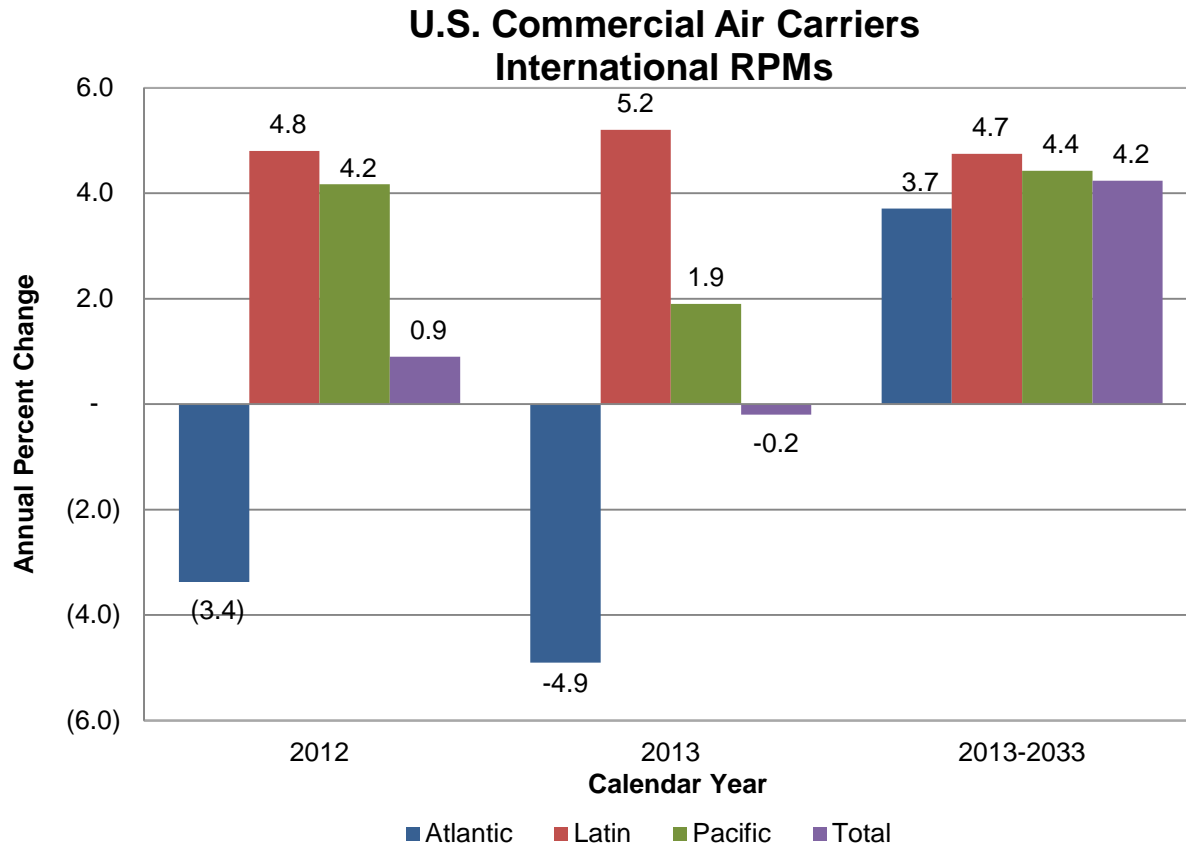
### U.S. Commercial Air Carriers International ASMs



U.S. commercial air carrier international RPMs and enplanements increased 0.9 and 2.4 percent, respectively, in 2012. The strong growth in enplanements relative to RPMs and ASMs highlights a return to earlier years when carriers actively restrained capacity as demand resumed following the world financial crisis in 2009. An increase in RPMs for the Latin market (up 3.9 percent) and Pacific market (up 4.2 percent) barely helped offset a substantial decrease in the Atlantic market (down 3.4 percent). In 2013, U.S. carrier international RPMs are expected to decrease by 0.2 percent as cuts in the Atlantic market (down 4.9 percent) more than offset increases in the Latin American market (up 5.2 percent), and the Pacific

market (up 1.9 percent). For the balance of the forecast, RPMs increase an average of 4.2 percent a year with the fastest growth showing in the Latin region (up 4.8 percent).

International enplanement growth for 2013 is projected to be 0.7 percent with the Atlantic region falling by 4.6 percent as the bleak economic outlook for Europe impacts demand. Enplanements are projected rebound at 3.8 percent in 2014 with all regions showing gains. Over the balance of the forecast period (2015-2033), enplanements are forecast to increase an average of 4.1 percent a year with the fastest growth in Latin and Pacific markets (up 4.5 and 4.2 percent a year, respectively).



The growth in U.S. carrier international passengers over the period 2012-2033 (4.0 percent a year) compares favorably to the growth in overall international passengers (4.1 percent a year, including the U.S.-Canada transborder market). Forecasts of international demand assume U.S. and foreign flag carriers will benefit from improving economic activity in both the United States and world markets.

International load factor for U.S. commercial carriers was 81.3 percent in 2012, an increase of 0.6 points from 2011. Load factor is expected to increase another 0.3 points in 2013 as capacity falls a bit faster than traffic. International load factor is projected to increase 0.5 points to 82.1 percent in 2014 as traffic growth exceeds capacity growth in all three world markets and remains at that level for the remainder of the forecast out to 2033.

International passenger real yields for U.S. mainline carriers were up 2.1 percent in 2012 as all regions posted increases with the largest increase in the Pacific market (up 3.5 percent), followed by the Latin and the Atlantic markets (both up 1.7 percent). Excess capacity in the Latin market coupled with weak demand in the Atlantic market leads to a 3.4 decline in international real yield in 2013. For the remainder of the forecast period, real yield decreases an average of 0.7 percent a year. In nominal terms, international yields are forecast to decrease 2.0 percent in 2013, and increase 1.1 percent in 2014 and then grow at an annual rate of 1.3 percent over the remainder of the forecast. The decline in real yields assumes competitive pressures and technological improvements will hold the line on fare increases.

### **Commercial Air Carriers – Air Cargo**

Historically, air cargo activity tracks with GDP. Additional factors that affect air cargo growth are fuel price volatility, movement of real yields, and globalization. Significant structural changes have occurred in the air cargo industry; among these are air cargo security regulations by the FAA and TSA, maturation of the domestic express market, a shift from air to other modes (especially truck), use of all-cargo carriers (e.g., FedEx) by the U.S. Postal Service to transport mail, and the increased use of mail substitutes (e.g., faxes, e-mail).

The forecasts of Revenue Ton Miles (RTMs) are based on several assumptions specific to the cargo industry. First, security restrictions on air cargo transportation will remain in place. Second, most of the shift from air to ground transportation has occurred. Finally, long-term cargo activity will be tied to economic growth.

The forecasts of RTMs were based on models that link cargo activity to GDP. Forecasts of domestic cargo RTMs were developed with real U.S. GDP as the primary driver. Projections of international cargo RTMs were based on growth in world GDP, adjusted for inflation. The distribution of RTMs between passenger and all-cargo carriers was forecast based on an analysis of historic trends in shares, changes in industry structure, and market assumptions.

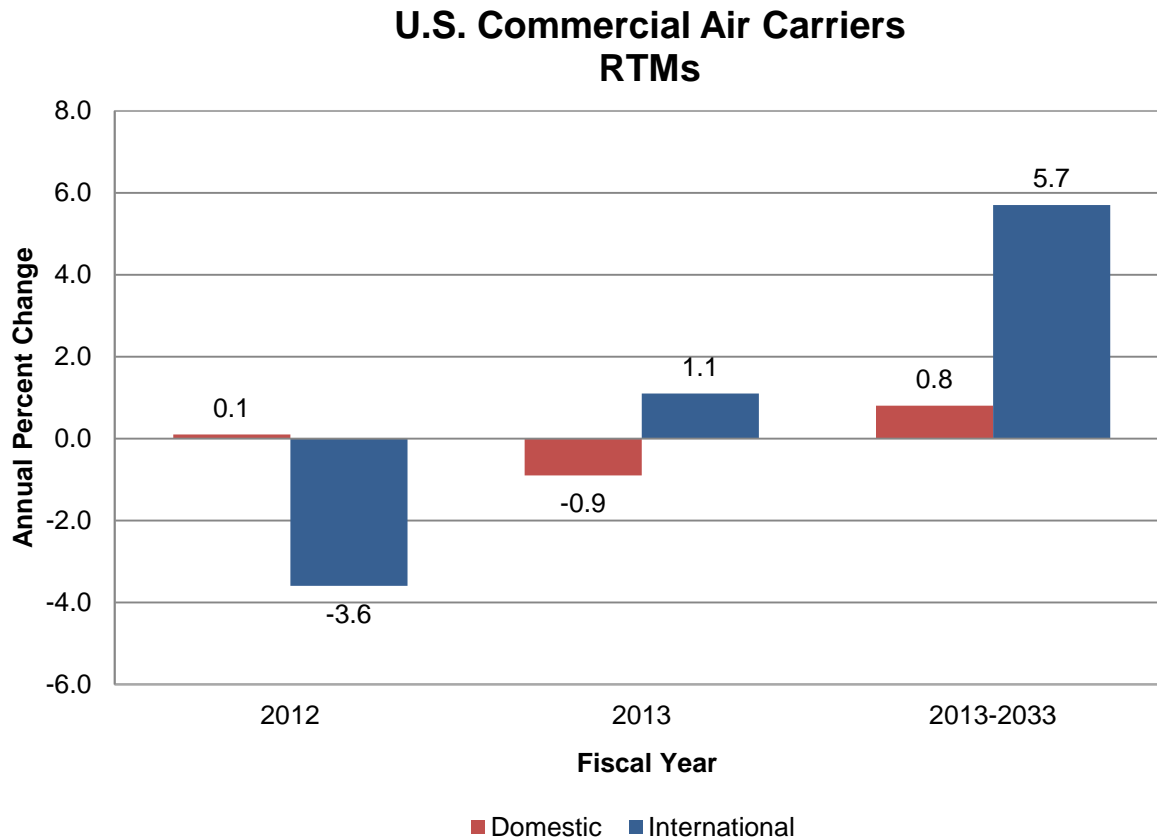
Total RTMs shrank by 2.4 percent in 2012 but are forecast to grow slightly (up 0.4 percent) in 2013. Driven by steady U.S. and world economic growth, total RTMs are projected to increase at an average annual rate of 4.6 percent for the balance of the forecast period.

Domestic cargo RTMs increased by 0.1 percent in 2012 and are forecast to decline by 0.9 percent in 2013. Between 2013 and 2033, domestic cargo RTMs are forecast to increase at an average annual rate of 0.8 percent.

The freight/express segment of domestic air cargo is highly correlated with capital spending. Thus, this segment's growth will be tied to growth in the economy. The mail segment of domestic air cargo will be affected by price and substitution (e.g. e-mail).

The all-cargo carriers have increased their share of domestic cargo RTMs flown from 70.0 percent in 2000 to 88.0 percent in 2012. This is because of the shrinkage of the domestic freight/express business for passenger carriers as they have responded to the substantial shocks to the aviation system during this time. Shrinking networks, elimination of unprofitable flying, and consolidation have reduced opportunities for growth in their freight/express business. The all-cargo share is

forecast to grow to 89.9 percent by 2033 based on increases in capacity for all-cargo carriers and ongoing security considerations.



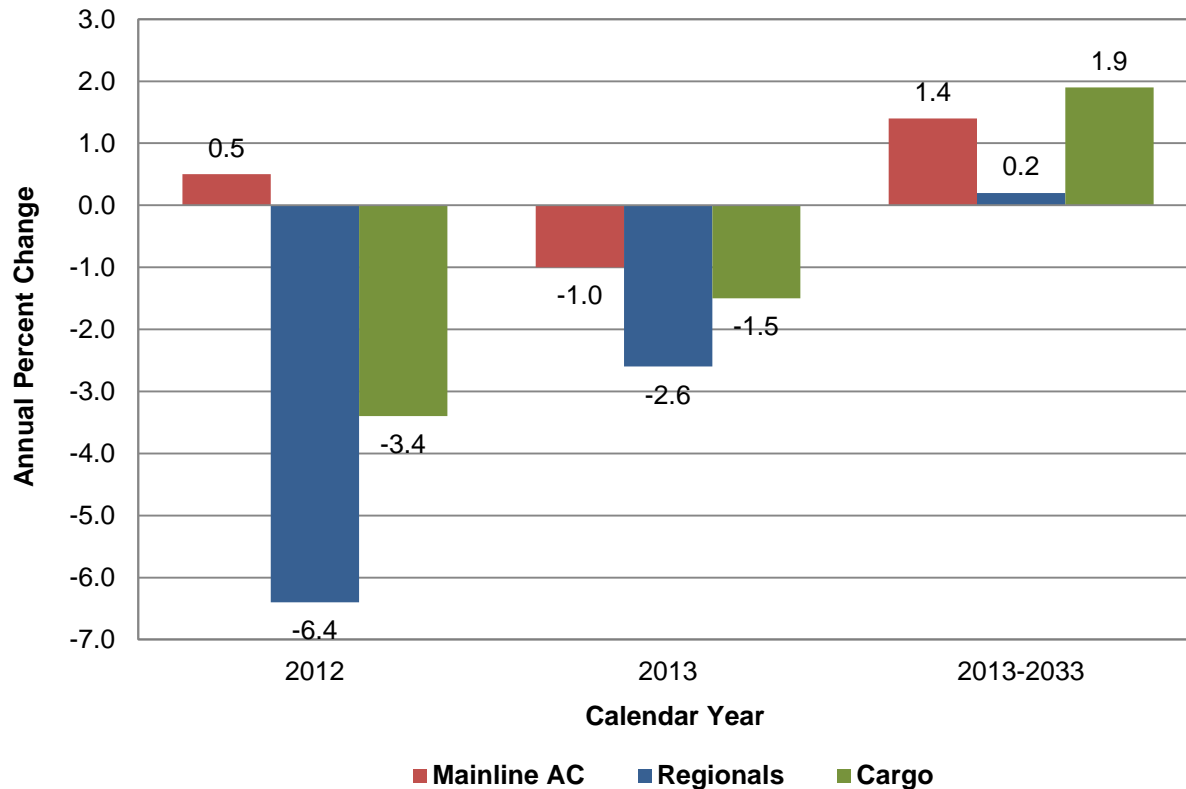
International cargo RTMs unexpectedly fell 3.6 percent in 2012 as fallout from the European debt crisis and a slowdown in China's economic growth slowed worldwide trade.. They are projected to grow 1.1 percent in 2013 as global trade growth resumes. For the balance of the forecast period, (2013-33) international cargo RTMs are forecast to increase an average of 5.7 percent a year based on projected growth in world GDP.

The share of international cargo RTMs flown by all-cargo carriers increased from 49.3 percent in 2000 to 74.7 percent in 2012. Continuing the trend experienced over the past decade, the all-cargo share of international RTMs flown is forecast to increase modestly to 81 percent by 2033.

## Commercial Aircraft Fleet

The number of commercial aircraft is forecast to grow from 7,024 in 2012 to 8,554 in 2033, an average annual growth rate of 0.9 percent or 73 aircraft annually. The commercial fleet is projected to decrease by 113 aircraft in 2013 after shrinking by 174 aircraft in 2012 as the slow recovery in demand and rising fuel prices prompted carriers to prune their fleets. Since 2007, the U.S. commercial airline fleet has contracted by 713 aircraft. In comparison, the U.S. commercial fleet contracted by 262 aircraft between 2000 and 2003, the last downturn in aviation.

### U.S. Commercial Aircraft Fleet Calendar Years 2012-2033



The number of passenger jets in the U.S. mainline carrier fleet increased by 19 aircraft in 2012 but is expected to fall by 37 aircraft in 2013 as network carriers continue to remove older, less fuel efficient narrow body aircraft. After 2013, the mainline air carrier passenger fleet increases an average of 58 aircraft a year over the remaining years of the forecast period, totaling 4,907 aircraft in 2033. The narrow-body fleet (including E-190's at JetBlue and U.S. Airways) is projected to grow by 28 aircraft annually over the period 2012-2033; the wide-body fleet grows by 26 aircraft a year as the Boeing 787 and Airbus A350's enter the fleet.

The regional carrier passenger fleet is forecast to decrease by 63 aircraft in 2013 as increases in larger regional jets are more than offset by reductions in 50 seat and smaller regional jets and turboprops. After 2013, the regional carrier fleet is expected to increase by an average of 5 aircraft (0.2 percent) a year over the remaining years of the forecast period, totaling 2,436

aircraft in 2033. The number of regional jets (90 seats or fewer) at regional carriers is projected to grow from 1,645 in 2012 to 2,082 in 2033, an average annual increase of 1.1 percent. All of the growth in regional jets over the forecast period occurs in the larger 70 to 90-seat aircraft. During the forecast period, all regional jets of 50 or less seats are removed from the fleet, reflecting the relaxation of scope clauses. The turboprop/piston fleet is expected to shrink from 758 units in 2012 to 354 in 2033. Turboprop/piston aircraft are expected to account for just 14.5 percent of the regional carrier passenger fleet in 2033, down from a 31.5 percent share in 2012.

Cargo large jet aircraft are forecast to decrease by 28 aircraft over the next two years (from 840 to 812 aircraft in 2014), and then grow to total 1,211 aircraft in 2033. The narrow-body, cargo jet fleet is projected to increase by 3 aircraft a year over the 21-year forecast period as older 757's and 737's are converted to cargo service. The wide-body, cargo jet fleet is projected to increase by 14 aircraft yearly.

## **General Aviation**

The FAA forecasts the fleet and hours flown for single-engine piston aircraft, multi-engine piston, turboprops, turbojets, piston and turbine powered rotorcraft, light sport, experimental and "other" (which consists of gliders and lighter than air vehicles). The FAA forecasts "active aircraft,"<sup>15</sup> not total aircraft. The FAA uses estimates of fleet size, hours flown, and utilization from the General Aviation and Part 135 Activity Survey (GA Survey) as baseline figures upon which assumed growth rates can be applied. The results of the 2011 survey were not available to use as the basis for our forecast this year. Therefore, estimates of 2011 fleet and hours were based on estimated number of general aviation aircraft in the FAA civil aircraft registration database by the end of CY 2011, and past rates of active aircraft and utilization by type of aircraft and age of the fleet. Figures for 2012 are estimated based on other activity indicators. Activity forecasts begin in 2013 and continue through 2033.

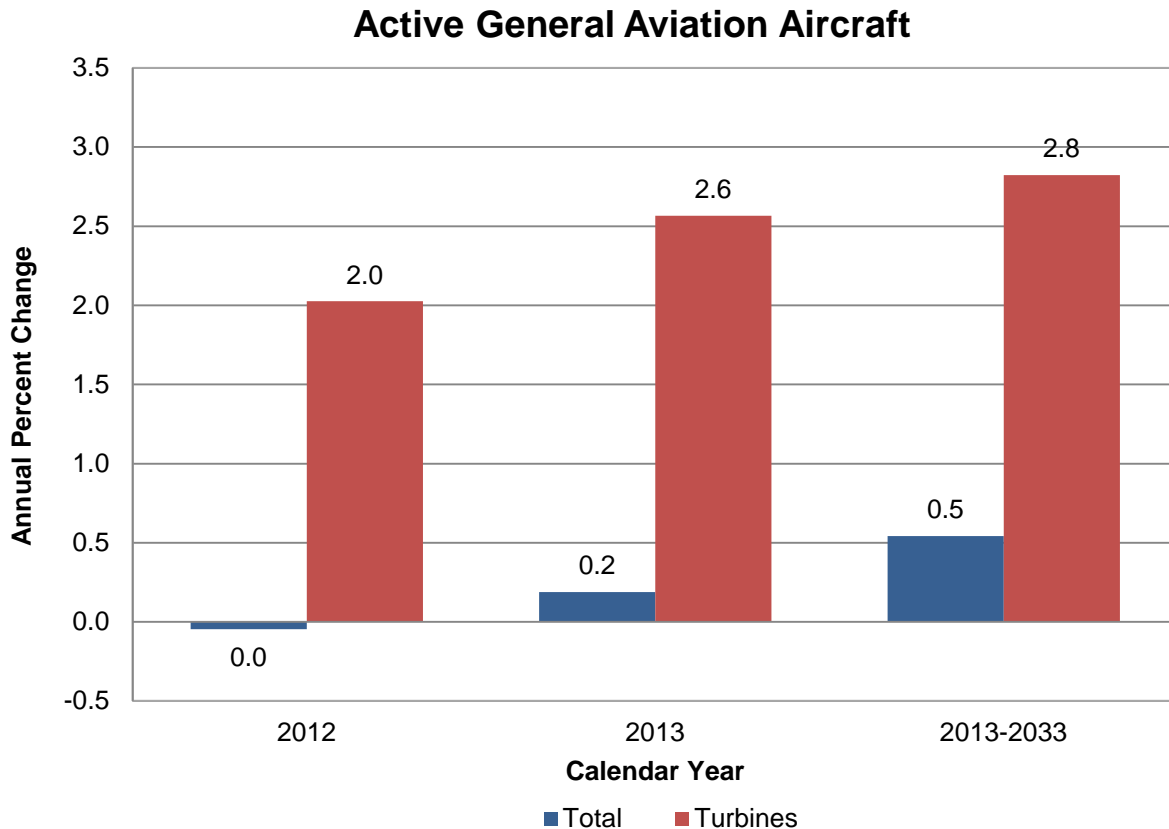
After growing rapidly for most of the past decade, and then slowing over the past few years, the most recent shipment activity indicates a cautiously optimistic outlook that the hard impact of the recession on the business jet market is coming to an end. The forecast calls for robust growth in the long term outlook, driven by higher corporate profits and the growth of worldwide GDP, though at rates lower than those predicted last year. Additionally, continued concerns about safety, security, and flight delays keep business aviation attractive relative to commercial air travel. As the industry experts and prior year's survey results report a significant portion of piston aircraft hours are also used for business purposes, we predict business usage of general aviation aircraft will expand at a faster pace than that for personal and recreational use. Increased demand, especially for agricultural use turboprop aircraft also contributes to increased turbine fleet and hours.

The active general aviation fleet is projected to increase at an average annual rate of 0.5 percent over the 21-year forecast period, growing from an estimated 220,670 in 2012 to 246,375 aircraft by 2033. The more expensive and sophisticated turbine-powered fleet

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<sup>15</sup> An active aircraft is one that flies at least one hour during the year.

(including rotorcraft) is projected to grow at an average of 2.8 percent a year over the forecast period, with the turbine jet portion increasing at 3.5 percent a year, reaching a total of 24,620 by 2033.



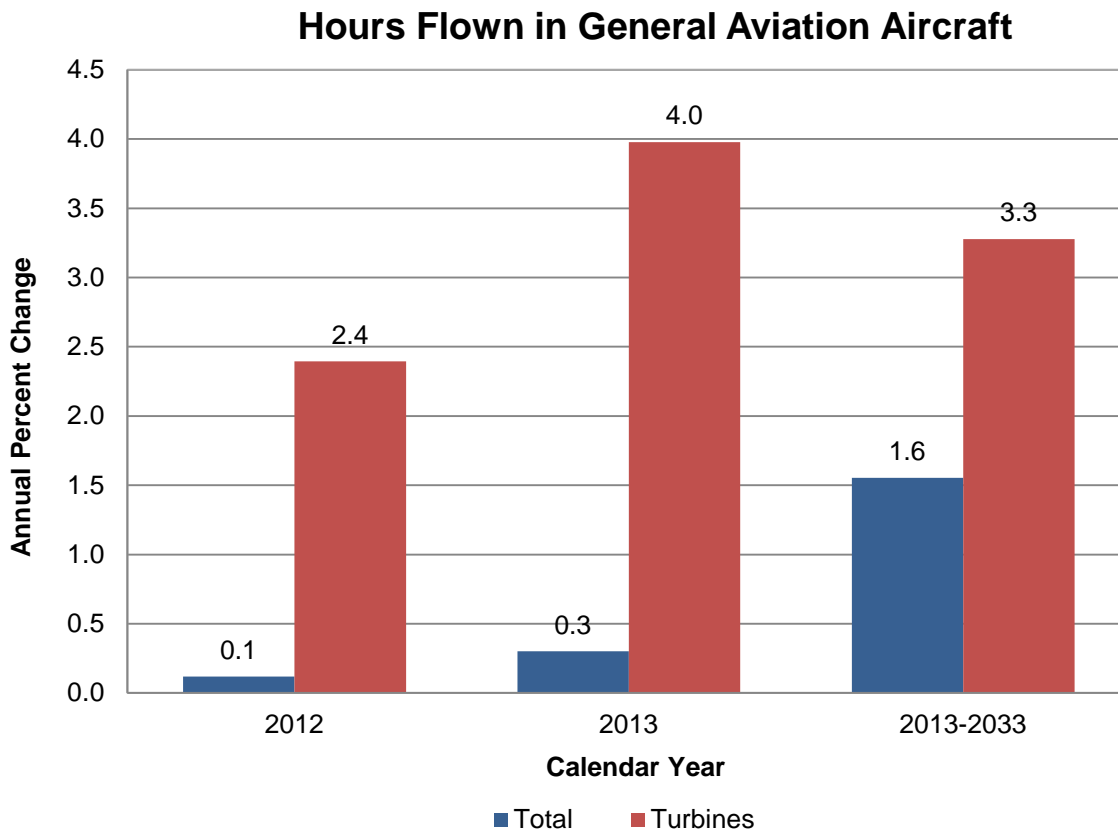
The number of active piston-powered aircraft (including rotorcraft) is projected to decrease from the 2010 total of 159,007 to 146,615 through 2028, with declines in both single and multi-engine fixed wing aircraft, but with the smaller category of piston-powered rotorcraft growing. Beyond 2028, new deliveries are expected to exceed retirements, and so active piston-powered aircraft are forecast to increase to 148,660 by 2033. Over the forecast period, piston-powered aircraft are projected to decrease by an average annual rate of 0.2 percent. Although piston rotorcraft are forecast to increase by 2.2 percent a year, they are a relatively small part of this segment of general aviation aircraft and therefore have little effect on the overall trend. Single-engine fixed-wing piston aircraft, which are much more numerous, are projected to decline at a rate of 0.2 percent, while multi-engine fixed wing piston aircraft are projected to decline by 0.6 percent a year.

Starting in 2005, a new category of aircraft (previously not included in the FAA's aircraft registry counts) was created: "light sport" aircraft. At the end of 2011, a total of 6,645 active aircraft were estimated to be in this category. The forecast assumes about 3.2 percent annual growth of the fleet through 2013. Thereafter the rate of increase in the fleet slows to about 2 percent per year. By 2033, a total of 10,245 light sport aircraft are projected to be in the fleet.

The number of general aviation hours flown is projected to increase by 1.5 percent yearly over the forecast period. The FAA projects above average growth in hours will occur after 2023 with



increases in the fixed wing turbine aircraft fleet, as well as a rebounding single engine piston fleet and increasing utilization of single engine piston aircraft as the aging of this fleet starts to slow down. In the medium term, much of the increase in hours flown reflects strong growth in the rotorcraft and turbine jet fleets. Hours flown by turbine aircraft (including rotorcraft) are forecast to increase 3.3 percent yearly over the forecast period, compared with a slight decline of 0.2 percent for piston-powered aircraft. Jet aircraft are forecast to account for most of the increase, with hours flown increasing at an average annual rate of 4.3 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with a measured recovery in utilization rates from recession induced record lows. Turboprop hours are also expected to increase significantly from what forecast last year, due to the recent trend of significant increase in agricultural use turboprop aircraft, with an average of 2.1 percent per year. Rotorcraft hours, which were less impacted by the economic downturn when compared to other categories and rebounded earlier, are projected to grow by 2.7 percent yearly. An expected decline in utilization rates of turbine rotorcraft is due to the assumption that recently improved affordability at the lower end of the turbine market will sustain the recent market share shift toward turbines; however, as turbine powered rotorcraft replaces the pistons, and since most of their functions will remain unchanged, utilization rates of some of the new turbines will be closer to those of the pistons. Lastly, the light sport aircraft category is expected to see an increase in hours flown of 3.3 percent a year; this is primarily driven by growth in the fleet.



The number of active general aviation pilots (excluding air transport pilots) is projected to be 508,300 in 2033, an increase of over 40,000 (up 0.4 percent yearly) over the forecast period.

Commercial pilots are projected to increase from 116,400 in 2012 to 131,800 in 2033, an average annual increase of 0.6 percent. The number of student pilots is forecast to decrease at an average annual rate of 0.1 percent over the forecast period, declining from 119,946 in 2012 to 117,400 in 2033. In addition, the FAA is projecting that by the end of the forecast period a total of 14,200 sport pilots will be certified. As of December 31, 2012, the number of sport pilot certificates issued was 4,493 reflecting a steady increase in this new “entry level” pilot certificate that was only created in 2005. The number of private pilots is projected to grow at an average yearly rate of 0.2 percent over the forecast period to a total of 195,600 in 2033 from 188,001 in 2012.

## **FAA Workload Forecasts**

### ***FAA and Contract Towers***

Activity at the 514 FAA (264) and contract towers (250) totaled 50.6 million operations in 2012, down 0.3 percent from 2011. Activity is projected to fall another 0.3 percent in 2013, with declines in both commercial and non-commercial activity. Growth in total activity at FAA and contract towers resumes in 2014 (1.0 percent) and for the balance of the forecast, activity grows at an average rate of 1.0 percent per year, reaching 61.1 million operations in 2033.

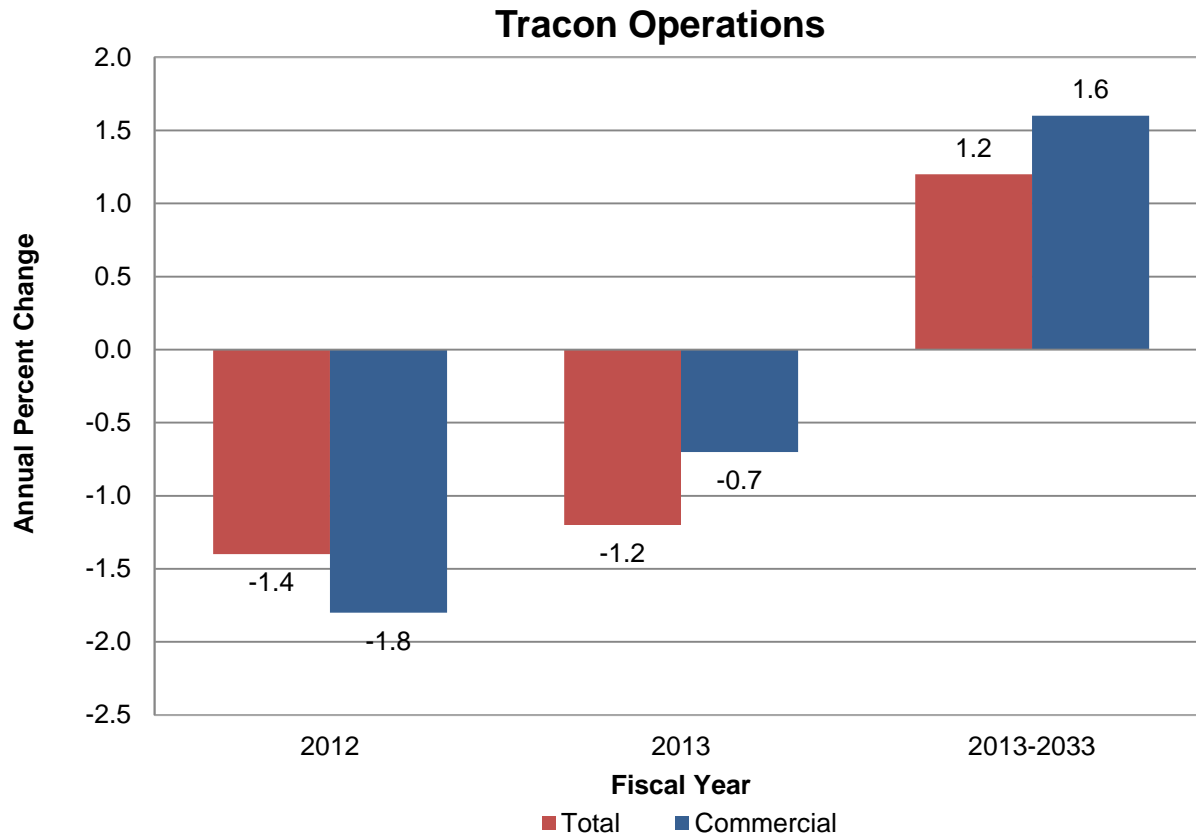
Most of the growth over the forecast period results from increased commercial aircraft activity (up 1.6 percent annually). Air carrier activity is projected to increase slightly (0.6) percent in 2013 as carriers keep capacity under control given the uncertain economic environment. Beyond 2013, air carrier activity is projected to increase an average of 2.5 percent per year over the forecast period. The increase in air carrier activity is driven by combination of mainline carriers increasing capacity in response to growing demand as well as an increase in the operations of 70-90 seat jets which are counted in the air carrier category. Commuter/air taxi operations are forecast to fall 1.9 percent in 2013 and decrease 0.1 percent a year for the balance of the forecast period as regional jets less than 50 seats exit the industry.

General aviation activity increased 0.6 percent in 2012 as local activity rose 1.5 percent.. Overall general aviation activity is projected to fall slightly in 2013 (down 0.2 percent) reflecting the impact of the uncertainty surrounding the economic outlook before beginning to rise modestly in 2014 (up 0.4 percent) as a growing economy promotes the growth of flight hours and operations. For the entire forecast period, general aviation activity at towered airports is projected to increase an average of 0.4 percent a year, to 28.5 million operations in 2033. General aviation activity at combined FAA/contract towers grows in line with the modest increase forecast for general aviation piston hours already cited. Most operations at the smaller towers are in piston aircraft, while those at the largest airports tend to be turbine operations.

Military activity fell 2.0 percent in 2012 and is assumed to remain at 2012 levels (2.6 million) throughout the balance of the forecast period.

The forecasted growth in operations is not uniform across all facility categories. Over the forecast period, total operations at large hub airports (those airports that enplane 1% or more of total US enplanements) are projected to increase from 12.4 million in 2013 to 17.2 million in 2033, an average annual rate of 1.7 percent a year. Operations at these facilities are overwhelmingly commercial in nature (95.3 percent in 2012) and their growth will mirror the growth in total commercial operations. Total operations at medium hub airports (those airports that enplane 0.25 to 0.99 percent of total US enplanements) are projected to increase a bit slower than the large hubs, averaging 1.5 percent a year over the forecast period, to total 7.2 million in 2033. In the largest category, small and non-hub airports, where 82 percent of the operations are non-commercial in nature, total operations are projected to increase from 32.8 million in 2013 to 36.7 million in 2033, an average annual rate of 0.6 percent a year.

Operations<sup>16</sup> at FAA TRACONs (Terminal Radar Approach Control) fell 1.4 percent in 2012, the eighth year in a row. They are projected to fall an additional 1.2 percent in 2013 as both commercial and non-commercial activity decline. After 2013, TRACON operations are forecast to increase at an average annual rate of 1.2 percent for the balance of the forecast. For the entire forecast period, TRACON operations grow an average of 1.2 percent per year, totaling 47.2 million in 2033.



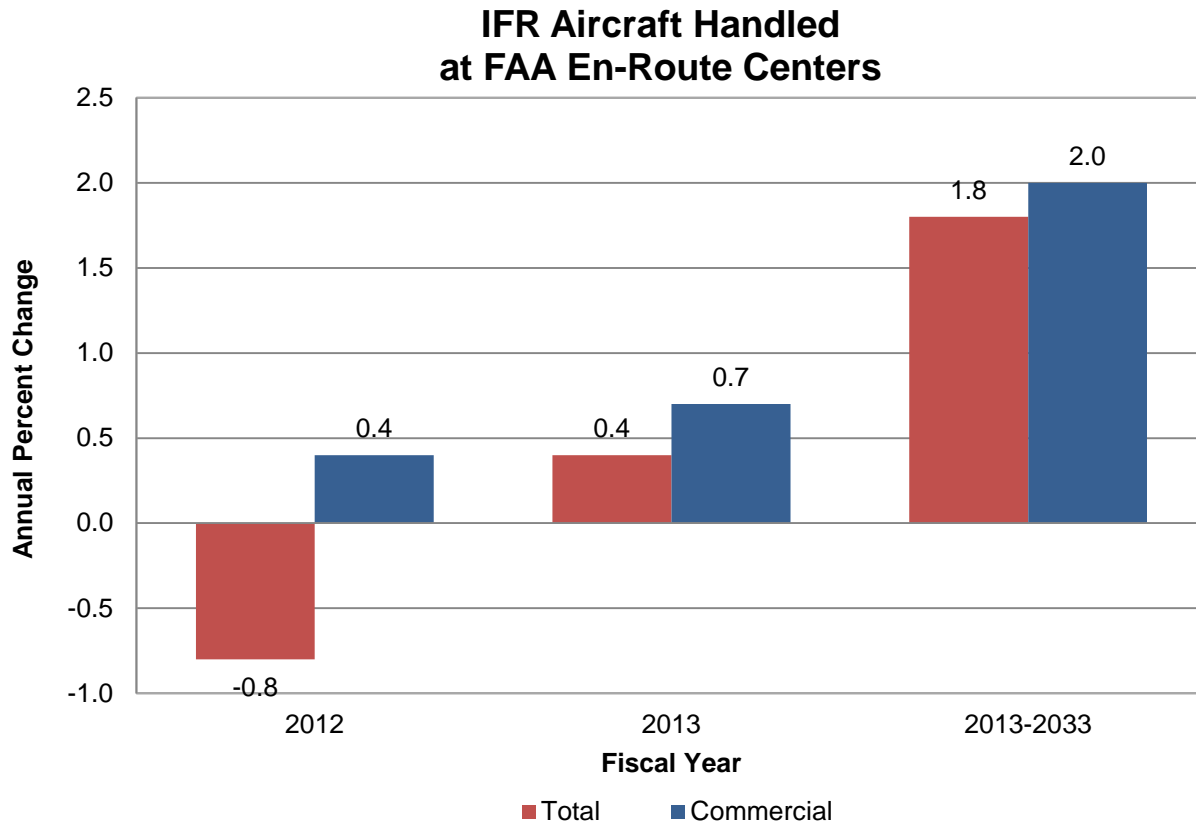
Over the forecast period, commercial aircraft operations at FAA TRACONs are forecast to increase at 1.6 percent per year driven by growth in air carrier activity. General aviation operations at FAA TRACONs are projected to grow 0.6 percent a year, reflecting the slow growth in the general aviation fleet and hours. Military activity is expected to remain at its 2012 level (2.3 million) of activity throughout the forecast period.

### ***En-route Centers***

The number of IFR aircraft handled at FAA en-route traffic control centers decreased 0.8 percent to 40.9 million in 2012, as declines in general aviation and military activity offset a slight increase in commercial aviation activity. In 2013 a modest increase in airline activity offsets a

<sup>16</sup> TRACON operations consist of itinerant Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) arrivals and departures at all airports in the domain of the TRACON as well as IFR and VFR overflights.

fall in general aviation activity, resulting in en-route center activity increasing by 0.4 percent. After 2013, through the balance of the forecast period, en-route activity increases 1.8 percent annually, reaching 58.2 million aircraft handled in 2033. Over the entire forecast period, commercial activity is projected to increase at an average annual rate of 1.9 percent, reflecting increases in the commercial fleet and aircraft stage lengths. During the same period, general aviation activity is projected to grow 0.7 percent per year, reflecting growth in business aviation. Military activity is held constant at the 2012 activity level throughout the forecast period.



Activity at FAA en-route centers is growing faster than at towered airports because more of the activity at en-route centers is from the faster growing commercial sector and high-end (mainly turbine) general aviation flying. Much of general aviation activity at towered airports, which is growing more slowly, is local in nature, and does not impact the centers.